Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Parts 1, 2, 22, 24, 27, 90 and 95	)	
of the Commission's Rules to Improve Wireless	)	WT Docket No. 10-4
Coverage through the Use of Signal Boosters	)	Released Apr 6, 2011
	)	
	)	
_____	)	

EX PARTE COMMUNICATION
MILLARD/RAINES PARTNERSHIP
("SMART BOOSTER")

Smart Booster
Intelligent Cellular Range Extender

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TABLE OF CONTENTS

	Page
Introduction……..	3
There Is No Consensus for Provisions of the Joint Proposal……..	5
The Carriers Will Lose Control of Their Spectrum to Broadband Consumer Grade Boosters ..…….	9
The Joint Proposal in Its Present Form Is a Prescription for Tragedy and Disaster…….	10
Conclusions …….	16
Certificate of Service……	19
Appendix 1: Intelligent Boosters Address All Interference Concerns	21
FCC 2.803 Compliance Notice.……	23

Introduction

Michael Millard and Jeremy K. Raines, Ph.D., P.E., inventors of the patented Smart Booster[1], shown in Fig. A1, are pleased to submit the following ex parte communication to WT 10-4.

In April 2011, the FCC released its Notice of Proposed Rulemaking concerning signal boosters in the hope of facilitating "the development and deployment of well-designed signal boosters…to empower consumers in rural and underserved areas to improve their wireless coverage...", while simultaneously creating "appropriate incentives for carriers and manufacturers to collaboratively develop robust signal boosters that do not harm wireless networks."[2] These are worthy objectives, which if attained, will benefit consumers and carriers alike.

As will be explained in detail, with one exception, solutions and compromises proposed to date will not satisfy the above goals stated in the NPRM. They will not provide consumers in rural and underserved areas with improved wireless coverage. Further, they will not leave wireless networks unharmed. The one exception is the intelligent signal booster. Appendix 1 describes the detailed operation of intelligent boosters.

Warning: The authorization of under-powered broadband boosters, especially including the Joint Proposal Consumer Grade booster, would be a serious mistake, both in the short and long term. Under-powered boosters will not provide the consumer in rural and other underserved areas with reliable wireless communication, and may, in fact, endanger them with a false sense of security. Further, both present and future wireless networks will be susceptible to damaging interference, severely compromising their capacity and intended operation. The sanctioning of broadband booster technology would do irreparable harm to the general public as well as the wireless networks.

On July 25, 2011, Wilson Electronics and Verizon Wireless filed Comments introducing the Joint Proposal, which specified a Consumer Grade booster.[3] Under threat of "License by Rule", some stakeholders appear willing to support at least some aspects of that Joint Proposal. It should be noted from the outset that the Joint Proposal is far from a consensus proposal, and with good reason. Those reasons will be outlined in the sections below.

[1] US Patent 8,049,664, Issued Nov 1, 2011
[2] NPRM, WT Docket 10-4, Adopted April 5, 2011, pg. 2 ¶1, 2
[3] NPRM, WT Docket 10-4, Comment submitted by Verizon and Wilson Electronics, July 25, 2011, Attachment 1 "Consumer Booster Specifications for CMRE Spectrum Bands".

Based upon solid engineering principles and calculations, if the Joint Proposal or some variation is adopted, we expect the following consequences:

1. The wireless network providers will lose control of their spectrum due to interference from broadband boosters, especially including the Consumer Grade booster described in the Joint Proposal.

2. Consumers will be deprived of reliable wireless communication in rural and other areas of presently unusable signal coverage, and they may be endangered as a result of false complacency regarding the under-powered Consumer Grade booster described in the Joint Proposal.

3. Future versions of the wireless network with increased receiver sensitivities will be severely, if not completely, compromised by broadband boosters that cannot be recalled.

With respect to providing wireless service for rural consumers, the Joint Proposal is a prescription for a watered-down signal booster. Put simply, the Consumer Grade booster lacks the power to get the job done. It has less output power than many popular handsets alone, and provides much less output power than nearly all of the signal boosters presently on the market, and upon which the record is stuffed with accolades from consumers. A booster built to the specifications in the Joint Proposal will not have enough power to satisfy one of the NPRM's main objectives, that is, improved coverage in rural and underserved areas.

Although inadequately powered to provide reliable rural communication, the Joint Proposal Consumer Grade booster will still have more than enough power to wreak havoc on metropolitan networks, a fact the carriers either don't fully appreciate, or are willing to overlook given the FCC's threat of License by Rule. After all, a watered-down booster might seem a step in the right direction if the primary focus is to eliminate booster interference. Indeed, this appears to be the focus and rationale behind T-Mobile's recent filing regarding the Joint Proposal.[4] Notice that not a single word of that filing advances, or even mentions, the objective of providing rural consumers with better wireless coverage!

[4] Ex parte notice of Verizon Wireless and T-Mobile USA, WT-Docket 10-4, May 4, 2012.

And yet, T-Mobile is not alone. All of the large carriers, and their industry associations, have at one time or another, filed comments imploring the Commission to either outlaw boosters entirely, or permit them only if they respect the spectrum rights of the licensee, and are controlled by the licensee. It is only with the promise of a watered-down booster, and the threat of License by Rule, that carriers even consider, reluctantly, to relinquish their long-proven track record of successful spectrum stewardship.

Intelligent signal boosters would alleviate all of the above concerns and make a shaky compromise based upon a watered-down broadband booster completely unnecessary.

There is No Consensus for the Provisions of the Joint Proposal.

Recent *"Ex parte"* submissions to the FCC by major cellular network providers continue to make a compelling case for intelligent signal boosters. Just as compelling in those submissions are reasons for rejecting the Joint Proposal Consumer Grade signal booster, which, in fact, can hardly be considered a booster at all since it radiates as much as 9 dB, or about 800 percent, less signal than many handsets without any booster. There can be no doubt, as summarized in Table 1, that there is no industry consensus concerning the Joint Proposal in general, and the Joint Proposal Consumer Grade booster in particular.

CARRIER	POSITION
AT&T Mobility	Strong advocate for continued spectrum stewardship, E-911 concerns
Blooston Licensees	Advocates spectrum-specific boosters with express carrier consent
Cincinnati Bell	Spectrum-specific boosters only with express written carrier consent
Metro PCS	Advocates spectrum-specific boosters and carrier stewardship
Sprint / Nextel	Joint Proposal has too much power
T-Mobile	Advocates spectrum-specific boosters, tentative Joint Proposal support
US Cellular	Spectrum-specific boosters only with express written carrier consent
Verizon	Proponent of the Joint Proposal

Table 1. As detailed above, the industry appears far from reaching a consensus on the Joint Proposal.

AT&T expresses concerns that signal boosters will compromise the accuracy of TDOA (Time Distance Of Arrival) calculations performed by LSU's (Location Sensor Units), which are used to determine the origin of Enhanced 911 emergency (E-911) calls from handsets. Intelligent

boosters would avoid that problem for the vast majority of E-911 calls, for at least two reasons. First, intelligent boosters turn themselves completely off where the signals provided by base stations are adequate. That is, there is no signal booster in the circuit to affect TDOA calculations at all. Second, in rural and similar regions where intelligent boosters turn themselves on, TDOA calculations and LSU's are generally not provided, or the Public Safety Answering Point (PSAP) may be incapable of processing the E-911 data. So, there is nothing to compromise. Further, if the choice is between successfully completing an E-911 call in a rural region with some location error, and not being able to complete the call at all, then the use of an intelligent signal booster is fully justified.

Sprint expresses concerns that signal boosters will interfere with wireless networks, even the Consumer Grade booster described in the Joint Proposal. In response, Sprint suggests that the power of that booster be reduced from 23 dBm at the antenna input terminals to 25 dBm EIRP (Effective Isotropic Radiated Power). Note that 25 dBm EIRP generally requires a reduction of the input power to the antenna from 23 dBm because of the directive gain added by the antenna, for example, 2.1 dB for a half-wave dipole. Smart Booster has carefully explained in previous submissions to the FCC that even reduced power will prove harmful to the wireless networks in regions that already provide adequate signal strength. In those regions, the cumulative radiated power from multiple signal boosters will raise the RSSI (Received Signal Strength Indicator) at the base stations, with undesirable consequences. The base stations will instruct handsets to increase their output power, which, in turn, will shorten their battery lives, and connections with those handsets that are already at their maximum power settings will be dropped. An elevated RSSI at the base station also results in performance penalties because handsets are forced to communicate with more distant network nodes, thereby over burdening their design capacities.

Further, a 25 dBm EIRP specification renders the Consumer Grade signal booster a useless toy in rural regions where it is needed most. It will not provide enough signal to connect with a distant base station, even if that station is the closest one.

Sprint's comments are well founded and should come as no surprise. Even according to Wilson Electronics, "The Joint Proposal obviously does not represent an industry consensus on the technical requirements for robust signal boosters that do not harm wireless networks. However, it does detail the technical requirements that Verizon Wireless and Wilson agree

should be imposed on the manufacture of CMRS signal boosters to prevent harm to wireless networks."[5] Curiously, there is no mention whatsoever about improving the wireless signals of subscribers located in rural or underserved areas!

A Consumer Grade signal booster with a 25 dBm EIRP is more accurately described a signal suppressor because there are cellular and PCS handsets that radiate more power on their own. The use of dBm units is nothing but a smokescreen. In fact, 25 dBm is only 316 milliwatts. By comparison, at least three different models of the popular RIM (Research in Motion) Blackberry radiate 1644 milliwatts. In this example, the Consumer Grade signal booster reduces signal power by more than 7 dB, or over 500 percent. In our Reply Comments dated August 24, 2011, we attached a more extensive list of handsets with greater output power than the proposed Consumer Grade booster. The FCC has an obligation to the public to protect it from the false complacency of being equipped with a Consumer Grade signal booster that, in fact, functions as a signal suppressor, and which increases the chances of being stranded in a dangerous situation. Surely, the public deserves better transparency.

Sprint's concerns are completely alleviated by an intelligent booster. An intelligent booster will be completely off in regions of adequate signal strength, as well as locations near radio sensitive areas such as FCC-mandated Quiet Zones, deep space radiotelescope facilities and similar installations . No other booster operates in this manner. Only an intelligent booster will provide adequate power in rural regions to provide a robust connection with even distant base stations, while providing these protections.

Metro PCS expresses concerns that signal boosters in the hands of consumers allows them uncontrolled and potentially damaging use of spectrum in which the wireless carriers have invested substantial sums. Of particular concern is that the Joint Proposal Consumer Grade booster does not attach to the network and thus cannot be controlled by it. It will make autonomous decisions regarding its output power and those decisions, no matter how well-intentioned or how they are derived, will frustrate the handset power control algorithms used by the networks to optimize system capacity. In that way, the wireless carriers have lost much of their control over their spectrum. With respect to presently available signal boosters, and with respect to boosters described in the Joint Proposal, Smart Booster completely agrees; however, intelligent boosters completely alleviate those concerns.

[5] Comments of Wilson Electronics, WTB 10-4, submitted July 25, 2011 pp.3

Central to an intelligent booster is a memory card, and that card preserves complete control of the spectrum by the wireless carriers, even as the booster changes geographic location. The memory card specifies where the intelligent booster will be on or off, how much gain the booster will provide when it is on, and which spectrum blocks will be amplified when it is on. Further, the memory card specifies when its information will no longer be applicable, that is, an expiration date, and the intelligent booster will become inoperative after that date. When an updated memory card is obtained, the intelligent booster resumes operation. By controlling the information on that memory card, the carriers retain complete control of their spectrum, both in the present and in the future. In its meetings with WTB, Smart Booster agreed that an expiration date of not longer than one year would comply with existing Commission requirements for the licensee to maintain effective control of the device. A carrier may of course opt for a shorter duration, particularly if network changes are pending in the short term for previously underserved areas. The periodic requirement for a consumer to update a memory card also ensures 100 percent compliance with any FCC device registration requirements adopted as a result of these proceedings, even when the devices are later re-sold in the secondary markets such as eBay®, Craigslist, flea markets and garage sales.

Intelligent boosters are the only devices that can protect all existing and future wireless technologies. Without a memory card, and without an expiration date, obsolete boosters will continue to operate and interfere with future handsets and base stations that depend upon increased sensitivities or changes to the power control algorithms used by future networks. Further, by controlling the distribution of the intelligent booster's memory card, if they so choose, the wireless carriers will find themselves the proprietors of a highly profitable enterprise.

The Carriers Will Lose Control of Their Spectrum to Broadband Consumer Grade Boosters.

There is no doubt that legitimizing broadband boosters will take away exclusive use of the spectrum in which wireless network providers have invested substantial sums. The present, non-intelligent generation of boosters, including the one described in the Joint Proposal, are broadband and radiate into the entire wireless spectrum without regard to licensed area boundaries. In contrast, intelligent boosters radiate only into the spectrum owned by a particular wireless network provider, even if the booster changes location.

It is easy to understand why broadband operation is a problem. Fig. 1 is reprinted from Wilson Electronics' ex parte filing of March 8, 2012. It has been redrawn to show the FCC license boundaries currently in effect. According to Wilson, use of their Joint Proposal compliant booster will trespass some 25 square miles into territory licensed to another carrier. It is important to understand that at these same locations, the booster will most likely be broadcasting at or near maximum power. Since the handset emissions will not be synchronized with, or understood by, the carrier in the adjacent territory, the handset and booster emissions are simply noise, directly reducing the capacity and coverage of that carrier's network. Ironically, this is the very situation that FCC licensing and carrier stewardship were designed to solve.

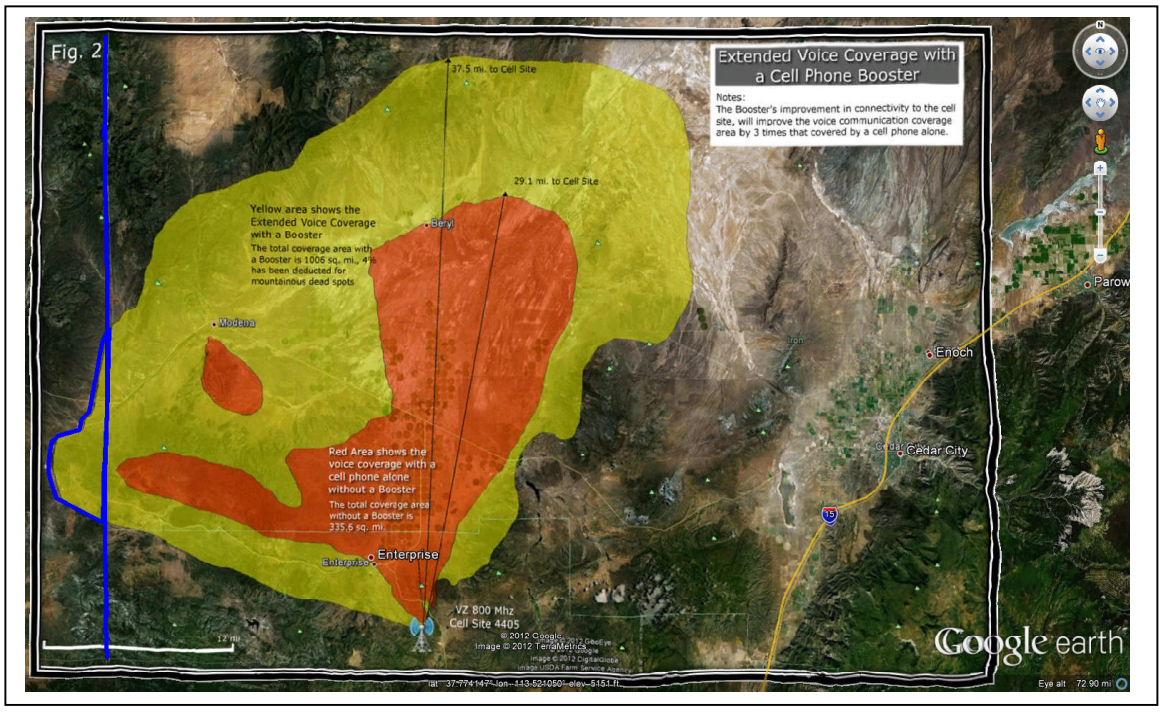

Fig. 1 Shown above is a reprint of the study area described by Wilson Electronics. It clearly shows approximately 25 square miles of broadband signal intrusion into the adjacent licensed spectrum resulting from the operation of a Joint Proposal compliant booster at maximum power on, near or even beyond the license border. Clearly such unrestricted operation tramples on the spectrum rights of the adjacent licensees and results in degraded network performance for subscribers to those affected networks.

It is easy to understand why only an intelligent signal booster avoids the need for a major Rulemaking by the FCC. Only intelligent boosters know which frequencies are licensed at a given location, and can accordingly exclude amplified signals at other frequencies. Only in this way can boosters intended for one wireless network provider avoid trespassing upon the spectrum of other providers regardless of where the booster is located.

Lest wireless providers be lulled into believing that low power, broadband boosters will not interfere significantly with their networks, they should be aware that the FCC's Enforcement Bureau maintains a file of interference complaints received via their online Cellular Telephone Interference Reporting Form, commonly referred to as "CTIX".[6] Smart Booster has no doubt that a review of the CTIX reports will reveal cases of sustained and widespread interference from every make and model of broadband booster in operation today.

If the wireless providers want to retain control over the spectrum in which they have heavily invested, then they must integrate intelligent signal boosters into their networks. Otherwise, a rule legitimizing non-intelligent, broadband signal amplifiers will permit booster operation with impunity over the entire cellular and PCS spectrum and place those networks at unnecessary and unjustified risk of interference.

The Joint Proposal in Its Present Form Is a Prescription for Tragedy and Disaster.

For many reasons, the Joint Proposal in its present form is both a tragedy and a disaster. It will be a tragedy for the consumer because the Consumer Grade signal booster specified by the Joint Proposal is nothing more than an expensive toy. It lacks sufficient power to provide reliable wireless communication to users in rural areas and in other areas of marginal or unusable signal strength. There are presently cellular and PCS handsets that alone provide more output power than the Consumer Grade signal booster. For example, at least three models of the RIM Blackberry radiate 9 dB, or about 800 percent more power.

The Joint Proposal will be a disaster for wireless network providers because it will not prevent interference to both present and future versions of their networks. A Consumer Grade signal booster with a specified output power of 23 dBm, 25 dBm, or even 30 dBm, depending upon whose comments to these proceedings may apply, is more than sufficient in urban areas to cause crippling interference to base stations that are designed to expect an RSSI in the neighborhood of –95 dBm. Today's newer 4G technologies expect an RSSI significantly less than that value, and Consumer Grade signal boosters will present an even greater threat to

[6] See: http://transition.fcc.gov/eb/ctix/

them. For example, LTE (Long Term Evolution) wireless technology expects an RSSI of less than –114 dBm. What levels will future technologies require?

The above conclusions were supported by rigorous engineering computations and design curves that were submitted in Reply Comments by Smart Booster submitted August 24, 2011. Smart Booster stands by those conclusions, and there is no need to repeat the supporting calculations in detail here.

We note that in March, 2012, Wilson Electronics submitted a coverage map purporting material improvement in performance by one of its products that allegedly complies with the specification of the Joint Proposal Consumer Grade booster.[7] That map is reproduced as Fig. 1 in the previous section of our comments, concerning interference with carriers in neighboring CGSA's (Cellular Geographic Service Areas). We doubt the accuracy, the reproducibility, and the interpretation of that coverage map. We especially doubt that the choice of location for Wilson's coverage map is representative for most of rural and underserved America. In particular, the base station site is on a tall mountaintop overlooking the Escalante Desert near Big Mountain, Utah. The terrain is mostly rock, devoid of any dense vegetation, and almost always lacking precipitation, all of which would, if present, require a significant fade margin for reliable wireless communication. One of the chief population centers is, in fact, the ghost town of Modena, Utah, population 33, with a commercial establishment shown in Fig. 3. No doubt, Wilson's coverage map assumes a fade margin of 0 dB, hardly realistic for most of the United States. A more representative example would have been in the Pacific Northwest, with areas of dense vegetation and steady rainfall, requiring a fade margin of at least 10 dB or greater. Under those conditions, a consumer equipped with a Joint Proposal Consumer Grade booster would be left stranded and perhaps endangered.

With respect to the coverage map's accuracy, Fig. 2 suggests that the Joint Proposal Consumer Grade booster contains some undisclosed miraculous technology that depends more upon neutrinos than electromagnetic waves. Only neutrinos can penetrate the 7-1/2 miles of solid rock that dominates the 303-degree radial. Note that the first Fresnel Zone is completely blocked, and yet the coverage map shows robust signal beyond the blockage. How can this possibly be observed in the real world? In fact, it cannot. Even though there is a road passing behind the rock formation, according to Fig. 1, Wilson either never performed any

[7] Ex parte communication, Wilson Electronics, WT-10-4, March 1, 2012

measurements there or elected not to share them. Evidently, coverage at that location was either assumed or interpolated. This is an outrageous assertion that casts serious doubt upon the credibility of the entire coverage map.

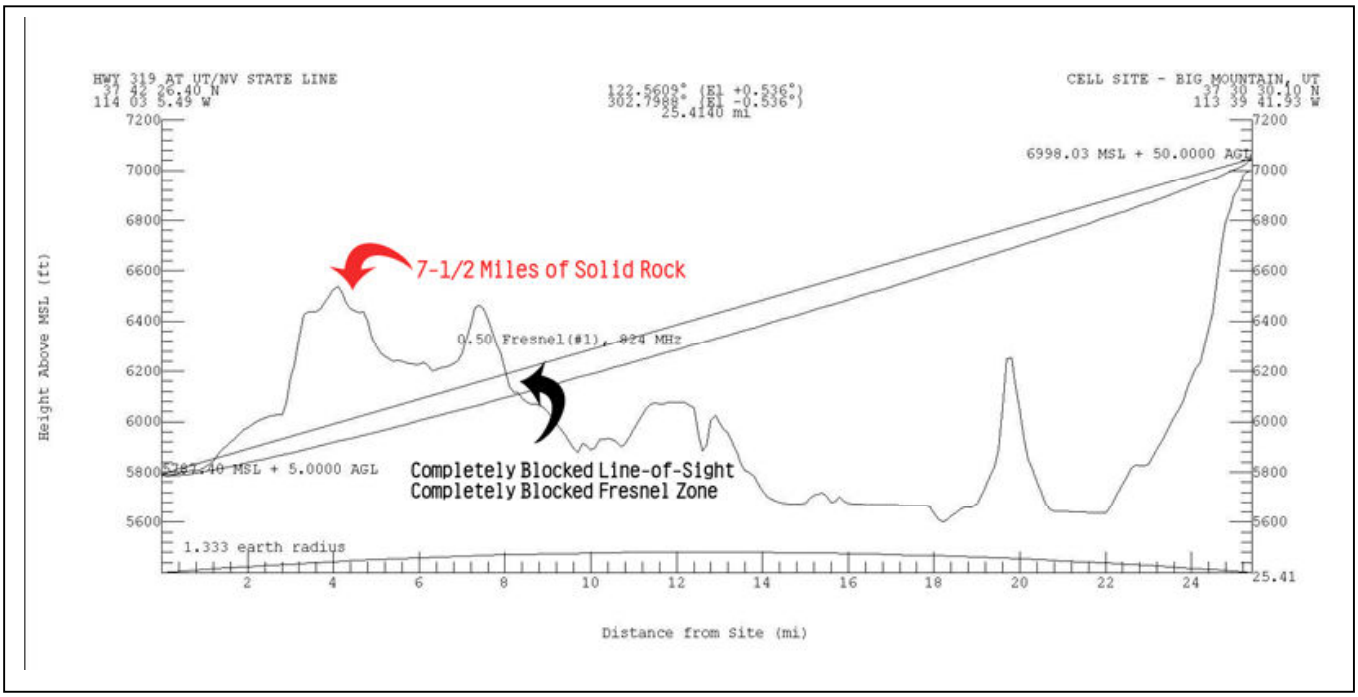

Fig. 2. The 303-degree radial in the Wilson coverage map is completely blocked by more than 7-1/2 miles of solid rock, including the entire first Fresnel Zone in both the vertical and horizontal planes. Yet the coverage map claims robust signal received beyond that obstruction, achieved by using a Joint Proposal Consumer Grade compliant booster. What is the miraculous technology that enables this, neutrinos? Surely electromagnetic waves cannot penetrate that obstacle.

What about the claims based upon Wilson's coverage map that the range of a handset is expanded by approximately 300 percent using a Consumer Grade booster? In fact, this is a sleight of hand. The expanded coverage only demonstrates that an external antenna overcomes the typically 15 dB of attenuation caused by enclosing a handset in an automobile. If that same handset were connected directly to an external antenna, then its coverage would no doubt be substantially superior than that attributed to the Consumer Grade booster. The Consumer Grade booster, by limiting radiated power to either 23 dB at the antenna input terminal or to 25 dB EIRP, is nothing but a signal suppressor. Its external antenna partially overcomes that suppression, giving the false impression that coverage is improved by the

booster. In fact, the consumer would be better off with an external antenna connected directly to the handset.

Furthermore, if Wilson's claim of 300 percent more coverage were ever realized in a metropolitan setting, the resulting pilot pollution incident on the handset from so many base stations would render it completely inoperable. No handset on the market today incorporates a receiver, or software, capable of organizing such a huge number of base station pilot channels. Consumers can not possibly be expected to realize this deception and will naively purchase any device claiming such wild improvements in wireless coverage.

A similar case can be made for the some booster manufacturer claims of "more than 20 times the power of your cell phone". For this to be true, the handset would have to be broadcasting at or near its minimum output power. It follows that the handset is located in very close proximity to the cell site and, therefore, does not need boosting at all. It is clearly an example *of reductio ad absurdum*. Even if a special circumstance could be contrived for the above claim to be true, then the handset alone is more than capable of powering up to continue the call without the need for a booster.

More telling, the selected study area largely excludes other carriers, or for that matter, any communications towers other than the towers on Big Mountain. As a result, any consideration of the resulting Swiss Cheese coverage inherent in downlink signal sensing boosters, as explained in detail in our Comments submitted on July 22, 2011, or interference to other operators within the study area are conveniently avoided. Furthermore, the selected study area is served only by the Verizon tower, perched high atop a 7,200 foot mountain with no winter access, hardly representative of metropolitan and suburban areas where the vast majority of consumer grade boosters will be deployed. As a result, proponents of the Joint Proposal have totally ignored important technical interference considerations such as handset pilot channel pollution or Ec/No ratios, which are of critical importance in more urbanized settings. In fact, it is within these very same urbanized areas that carriers have repeatedly complained about booster interference and have overwhelmed the CTIX database.

It seems booster manufacturers would rather hype performance in extreme desert situations than own up to the fact that booster operation is simply not needed in urban and well-served areas, where those networks are at an elevated and unacceptable risk of interference.

Fig. 3. One of the few population centers in the coverage map presented by Wilson Electronics is the ghost town of Modena. One of its commercial establishments is illustrated here. Obviously, coverage at this location completely ignores the threat of broadband boosters with respect to interference and diminished cell capacity.

Conclusions

The regulatory environment presently under consideration by the FCC and its respondents will be critical to the wireless communication industry for the foreseeable future. It is important to determine the correct environment, not a shaky compromise that will cripple present and future wireless technologies, and that also will force wireless network providers to surrender control of their spectrum in which they have invested substantial sums. The technology for that correct environment presently exists.

Intelligent signal boosters are the compelling logical choice for both the wireless network providers and for the consumer. All of the concerns expressed in the numerous ex parte filings by the providers are fully met by intelligent signal boosters. The need for reliable wireless communication in rural and other areas of marginal signal coverage is completely satisfied by intelligent signal boosters, without creating unacceptable risks to those networks deployed in areas where boosters simply are not needed.

Only intelligent signal boosters can preserve control by the providers of the wireless networks in which they have so heavily invested. The Consumer Grade boosters described in the Joint Proposal are broadband, and adopting that Joint Proposal enables them to trespass from the spectrum of one provider into the spectrum of others. In contrast, intelligent signal boosters know which spectrum is licensed to which providers at any particular location. Its filters will reject all other radiated signals.

Only intelligent boosters can protect present advanced and future wireless technologies. Other boosters will remain in operation long after they are obsolete and will, therefore, continue to pose a threat to future networks that operate with increased sensitivities. In contrast, intelligent signal boosters are aware with respect not only to location, but also to time, and they will deactivate after a specified expiration date.

The Consumer Grade signal booster described in the joint proposal is, in fact, not a booster at all but a signal suppressor, intended only to protect wireless networks in urban areas. It will not provide reliable signals in rural and other areas of marginal coverage. The 23 dBm signal specified by that proposal, and the even lower alternative 25 dBm EIRP suggested by one provider, are actually less than the output power of many off-the-shelf handsets. It must be understood that 23 dBm at the antenna terminals of the Consumer Grade booster is only 200

milliwatts, which is more than 9 dB, or about 800 percent less than the 1644 milliwatts available from such readily available handsets as the Blackberry without any signal booster. If a handset alone will leave the consumer stranded without wireless communication in rural regions, then, for sure a Consumer Grade signal booster, which effectively suppresses the output of that handset by 9 dB, will make the situation even more desperate. Surely, the FCC does not intend this fate for the consumer, and it states as much in its NPRM.

Further the Consumer Grade signal booster will require new rules that will force providers to surrender exclusive control of their spectrum.

Consumers expecting to make emergency calls from rural regions and other regions of marginal coverage are very likely to be left stranded and even endangered if they rely upon the Consumer Grade signal booster as described in the Joint Proposal. The consumer deserves much better than a 9 dB signal suppressor masquerading as a Consumer Grade signal booster. The informed consumer deserves the opportunity to choose an intelligent signal booster that can connect with a distant base station rather than leave him or her stranded in a remote area.

In view of the above, Smart Booster believes that allowing broadband signal boosters, including the Joint Proposal Consumer Grade booster, is a strategic error with far reaching negative consequences for present and future wireless networks.

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Smart Booster continues to recommend the following regulatory steps, which have been suggested in several previous filings.

1. Amend Rule 22.923 to permit boosters to be inserted between handsets and base stations, and update certain of its definitions.

2. Require all boosters to have a minimum amount of intelligence so that they know where to amplify, when to amplify, how much to amplify, and within which spectrum blocks to amplify.

3. Require that all intelligent boosters have a provision to guarantee that their intelligence is current.

4. Decertify all boosters that do not meet the above minimum requirements, including broadband boosters.

5. Require networks to support intelligent boosters by providing databases appropriately encoded on a compatible memory card in a timely manner.

Smart Booster believes that the Joint Proposal should be rejected for the many reasons described in this filing. The 23 dBm, 25 dBm EIRP, or 30 dBm restriction on input power to the antenna, depending upon whose comments are quoted, in fact, reduces the Consumer Grade booster to nothing but a signal suppressor, which clearly does not help the consumer who is stranded without wireless communication in a rural or similar region with inadequate signal coverage. When deployed with impunity in more developed areas, that same restriction places the networks at increased risk for interference. The reality of that risk is demonstrated by the FCC Enforcement Bureau's burgeoning CTIX file of cellular telephone interference reports. Clearly, the risk cannot be justified when handsets are fully capable of attaching to the networks without a Consumer Grade booster. The FCC has repeatedly affirmed its commitment to protect the consumer from harmful radio interference and false confidence in such an accessory.

Respectfully submitted,

Jeremy K. Raines, Ph.D., P.E.
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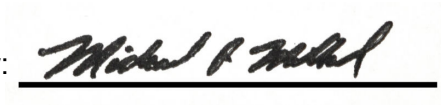
By: 

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Dated: May 16, 2012
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CERTIFICATE OF SERVICE

I, Jeremy K. Raines, Ph.D., P.E., do hereby certify that on May 16, 2012, I caused copies of the foregoing "Notice of Ex Parte Communications of Millard/Raines Partnership" to be delivered to the following via electronic or First Class US mail.

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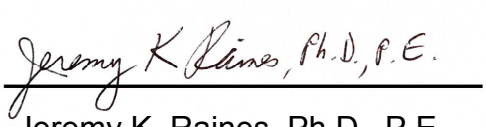

Jeremy K. Raines, Ph.D., P.E.
For Millard / Raines Partnership

Appendix 1: Intelligent Boosters Address All Interference Concerns.

Fig. A1 shows the essential elements of an intelligent signal booster, and it is seen how the wireless networks are protected and how the providers retain control of their spectrum.

The memory of the intelligent booster, combined with the GPS (Global Positioning System) sensing of its location, determines whether it should be on or off, how much signal gain is required if it is on, and what frequency blocks must be amplified. In that way, the intelligent booster is off in regions of adequate signal coverage and in regions not included in the license of the wireless carrier. The intelligent booster is on in regions of marginal or no signal coverage that fall within the license of the carrier. Further, the intelligent booster will amplify only those frequencies licensed to a particular carrier.

In addition, an emergency kill switch provides ultimate control to the carrier if for any reason it is necessary to disable the booster.

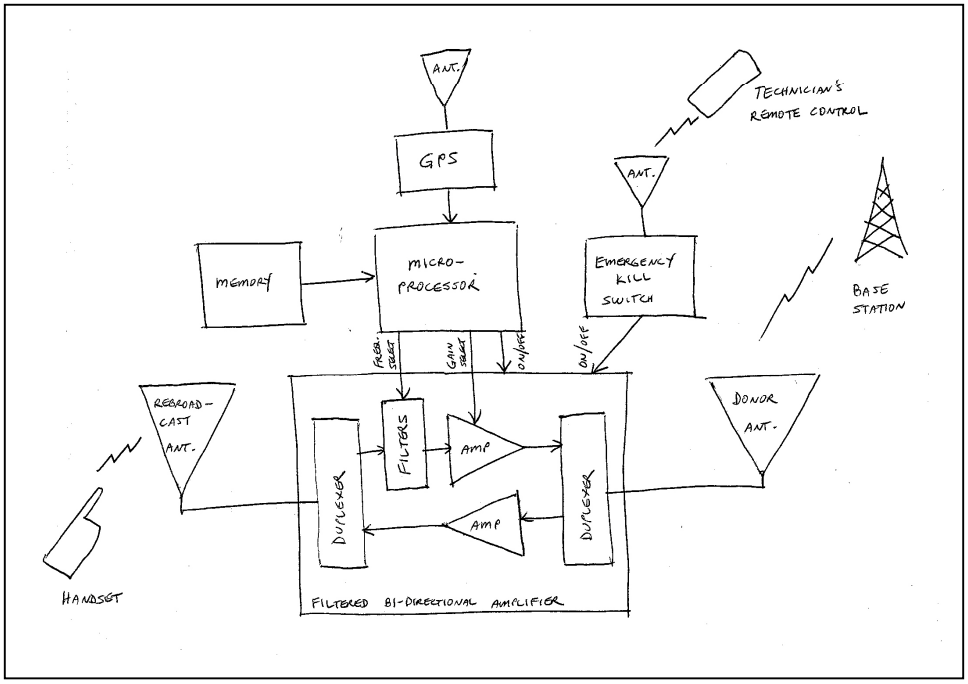

Fig. A1. A block diagram of an intelligent signal booster shows the features that distinguish it from the present generation of boosters. Location sensing ensures that the booster knows whether or not it is inside a cell already optimized for capacity. It also ensures that booster knows whether or not it is inside the licensed area of the wireless network provider. Filters ensure that the booster radiates only into that part of the spectrum licensed to the provider. Memory contains information about cell and licensed area boundaries, including which frequency blocks are in use. Further, the memory includes an expiration date beyond which the booster is disabled, thus protecting future wireless technologies.

FCC 2.803 Compliance Notice:

Prototype - Not for Sale
The Smart Booster device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.

Intellectual Property Notice: